WHAT IS CLAIMED IS

1. A system for determining the position of a permanent magnet motor, comprising:

a carrier signal generator for generating a high frequency carrier signal;

a motor drive coupled to the carrier signal generator and operable to receive the high frequency carrier signal and provide electrical signals to the motor related to the high frequency carrier signal;

a feedback loop for supplying feedback signals related to motor parameters influenced by the high frequency carrier signals;

a signal processor coupled to the feedback loop and operable to receive the feedback signal and calculate motor position based on a comparison of the high frequency carrier signal and information contained in the feedback signal.

2. The system according to claim 1, wherein the signal processor further comprises a filter for extracting the information.

3. The system according to claim 1, wherein the signal processor further comprises a complex vector phase lock loop for tracking rotor flux position based saliency.

4. A method for determining motor position in a permanent magnet synchronous motor, comprising:

injecting a high frequency carrier signal into a motor;

obtaining a feedback signal from the motor related to the injected high frequency carrier signal;

extracting information from the feedback signal related to motor position; and

analyzing the extracted information to obtain position dependent information.

5. The method according to claim 4, further comprising filtering the feedback signal to extract the position dependent information.

6. The method according to claim 4, further comprising extracting information from the feedback signal related to motor position with a complex vector phase lock loop.

7. The method according to claim 4, further comprising observing a phase of a second harmonic of the feedback signal to determine magnet polarity.

8. A method according to claim 4, further comprising injecting a voltage pulse into the motor aligned with an estimated magnetic axis; and

measuring a current magnitude resulting from the injected voltage pulse to determine a north magnetic pole.

9. The method according to claim 4, further comprising determining a lack of position dependent information in the feedback signal to indicate uniform motor magnet demagnetization.

10. The method according to claim 4, further comprising detecting mean inductance of the motor from the feedback signal to determine uniform motor magnet demagnetization.

11. The method according to claim 4, further comprising detecting a lack of negative sequence signal in the motor feedback signal to indicate uniform motor magnet demagnetization.

12. The method according to claim 4, further comprising detecting a change in a magnitude of a positive sequence signal in the motor feedback signal to indicate uniform motor magnet demagnetization.

13. The method according to claim 4, further comprising observing a negative sequence signal in the feedback signal to determine if a large DC offset is present to indicate local motor magnet demagnetization.

14. A processor operable to execute a set of instructions to determine motor position of a permanent magnet synchronous motor, the set of instructions comprising:

a first code section executable to inject a high frequency carrier signal into a motor;

a second code section executable to obtain a feedback signal from the motor related to the injected high frequency carrier signal;

a third code section executable to extract information from the feedback signal related to motor position; and

a fourth code section executable to analyze the extracted information to obtain the position dependent information.

15. A memory device capable of storing a program of machine instructions executable to determine a position of a permanent magnet synchronous motor, the machine instructions comprising:

a first code section for injecting a high frequency carrier signal into a motor;

a second code section for obtaining a feedback signal from the motor related to the injected high frequency carrier signal;

a third code section for extracting information from the feedback signal related to motor position; and

a fourth code section for analyzing the extracted information to obtain position dependent information.